CHAPTER 2
AIRCRAFT INFORMATION

2-1. Army Aircraft

CAUTION: Container loads that are to be airdropped from helicopter doors and doors of utility aircraft must be rigged with parachutes equipped with breakaway static lines.

The following Army aircraft are used to airdrop loads.

a. UH-1 (Iroquois) Helicopter. The UH-1 helicopter can carry supplies both internally (door loads) and externally (cargo hook loads). The allowable weight of the total cargo load is determined by responsible aviation personnel using weight limitation data provided in TM 55-1520-210-10. The weight and dimensional limits for both the door loads and the cargo hook loads are listed in Table 2-1.

b. UH-60 (Blackhawk) Helicopter. The UH-60 helicopter can carry supplies both internally (door loads) and externally (cargo hook loads). The allowable weight of the total cargo load is determined by responsible aviation personnel using weight limitation data provided in TM 55-1520-237-10. The weight and dimensional limits for both door loads and cargo hook loads are listed in Table 2-1.

c. CH-47 (Chinook) Helicopter. The CH-47 helicopter can deliver supplies as ramp loads and as cargo hook loads. The weight allowance of the total cargo load is determined by responsible aviation personnel using weight limitation data provided in TM 55-1520-240-10. Any standard A-7A cargo sling, A-21 cargo bag, or A-22 cargo bag load may be dropped from the cargo ramp. The maximum size of the load dropped from the external cargo hook is limited only by the maximum dimensions of the container.

Table 2-1. Load limitations for UH-1D and UH-60 helicopters

Door Load Data	UH-1D	UH-60
Weight (without parachutes)		
Maximum for A-7A or A-21	500 lb	500 lb
Minimum for each container	*	*
Dimensions (including parachutes)		
Length	48 in	48 in
Width	30 in	30 in
Height	42 in	42 in
* See Table 1-1 for the minimum weight requirements which are based on type of parachute used.		
Cargo Hook Load Data		
Weight. The maximum weight of the load is limited by the rated weight capability of the container and the maximum weight restrictions on the cargo hook.		
Dimensions. The maximum size of the load is limited only by the dimensions of the container.		

2-2. Air Force Aircraft

The C-130, C-141, and C-17 aircraft can deliver container loads from the paratroop door or from the cargo ramp.

a. Paratroop Door Loads. The maximum weight limit for the paratroop door load is 500 pounds excluding the weight of the parachute. However, if the load weighs more than 350 pounds, three trained designated pushers must assist the jumpmaster in pushing the load from the aircraft. The dimensions including the parachute must not exceed 48 by 30 by 66 inches. Loads are dropped before parachutists. Loads followed immediately by parachutists are rigged with parachutes having breakaway static lines. When the load is dropped from the paratroop door, the largest dimension will be placed in the upright position. The parachute must be placed on top of the load, or toward the inside of the aircraft.

b. Ramp Loads. A-7A and A-21 loads may be dropped off the ramp if a 42-inch skid board is attached. A-22 containers are dropped from the cargo ramp in a single or double stick. The number of containers dropped will vary depending on the type of aircraft and the skid board size (see Table 2-2 or 2-3). The maximum height of a container must not exceed 83 inches; the width of the container must not exceed 48 inches.

NOTE 1: Loads to be followed immediately by parachutists must be rigged, unless specified, with parachutes having breakaway static lines.

NOTE 2: High-velocity CDS must be rigged with breakaway static lines.

2-3. CVRS

The centerline vertical restraint system was designed to restrain container loads vertically in Air Force aircraft.

a. Description. The CVRS is designed to work with the dual rail system in an Air Force aircraft. It adds a rail in the center of the cargo area. The rail runs from the front of the cargo area of the aircraft to the rear and is bolted in place. Aircraft without the CVRS in place may be loaded with containers in a single stick formation in the center of the cargo area of the aircraft. Aircraft equipped with the CVRS in place may be loaded with A-22 containers positioned in a right stick formation, left stick formation, or both. On aircraft with the CVRS in place, when an A-22 container is being positioned in the right stick, the right edge of the skid is positioned in the right rail of the aircraft dual rail system and the left edge of the skid is positioned in the center rail. The left stick is loaded in a similar manner. On aircraft with the CVRS in place, each stick of containers is independent of the other.

NOTE: Any overhang must be placed lengthwise in the aircraft. If the container load has an overhang on three or four sides, the load must be dropped in a centerline configuration (non-CVRS).

b. Capabilities. Air Force aircraft equipped with the CVRS can drop single or double A-22 container loads in a single or double stick formation. Both sticks may be released simultaneously, or each stick can be dropped separately. All containers in a stick may be dropped on the same drop zone, or any combination of containers may be dropped on different drop zones. A separate release gate is required for each container or group of containers in each stick to be dropped on a separate drop zone. See Table 1-3 for release gate requirements.

Table 2-2. C-130 and C-141 aircraft CDS capabilities

Aircraft	Non-CVRS	CVRS
C-130		
48- by 48-inch skid	Only single stick, 1-8 containers.	Single or double stick, 1-16 containers. Must be dropped in even numbers when dropping double stick.
48- by 72-inch stretch container	Only single stick, 1-6 stretch containers.	Single or double stick, 1-12 stretch containers. Must be dropped in even numbers when dropping double stick.
48- by 96-inch double A-22 container	Only single stick, 1-4 double containers.	Single or double stick, 1-8 double containers. Must be dropped in even numbers when dropping double stick.
Number of separate drop zones capable of dropping to	Limited to number of drop zones.	Limited to number of bundles. Must be dropped in even numbers when dropping double stick.
C-141		
48- by 48-inch skid	Only single stick, 1-20 containers.	Single or double stick, 1-40 containers. Must be dropped in even numbers when dropping double stick.
48- by 72-inch stretch A-22 container	Only single stick, 1-15 stretch containers.	Single or double stick, 1-30 stretch containers. Must be dropped in even numbers when dropping double stick.
48- by 96-inch double A-22 container	Only single stick, 1-10 containers.	Single or double stick, 1-20 double containers. Must be dropped in even numbers when dropping double stick.
Number of separate drop zones capable of dropping to	Limited to number of drop zones.	Limited to number of bundles. Must be dropped in even numbers when dropping double stick.

Note: If the loads have a front or rear overhang, the number of container loads will be reduced.

2-4. Inboard Logistics Rail

The inboard logistics rail was designed to restrain container loads vertically in the C-17 aircraft.

a. Description. The inboard logistics rail is a permanent rail in the center of the C-17 aircraft cargo area. It runs from the front of the cargo area to the rear and folds down when not in use. The aircraft may be loaded with A-22 containers positioned in the right stick formation, left stick formation, or both. When A-22 containers are being positioned in the right stick, the right edge of the skid is positioned in the right rail of the aircraft air delivery system rail and the left edge of the skid is positioned in the inboard logistics rail. The left stick is loaded in a similar manner. Each stick of containers is independent of the other.

NOTE: The width of the container load MUST NOT exceed 48 inches.

b. Capabilities. The C-17 aircraft can drop single or double A-22 cargo bag loads in either a single or double stick configuration, but double sticks must have an even number of containers. Both sticks may be released simultaneously, or each stick can be dropped separately. All containers in a stick may be dropped on the same drop zone, or any combination of containers may be dropped on different drop zones. A separate release gate is required for each container or group of containers in each stick to be dropped on a separate drop zone. See Table 1-3 for release gate requirements.

Table 2-3. C-17 aircraft CDS capabilities

Aircraft	Inboard Logistics Rail
C-17	
48- by 48-inch skid	Single or double stick, 1-30 containers. Must be dropped in even numbers when dropping double stick.
48- by 72-inch stretch A-22 container	Single or double stick, 1-20 stretch containers. Must be dropped in even numbers when dropping double stick.
48- by 96-inch double A-22 container	Single or double stick, 1-14 double containers. Must be dropped in even numbers when dropping double stick.
Number of separate drop zones capable of dropping to	Six for single stick and up to five for double stick. Must be dropped in even numbers when dropping double stick.
Note: If the loads have a front or rear overhang, the number of containers will be reduced.	

2-5. Release Gate Load Spreader

Anytime a container is rigged for CDS and offered as the aft-most container but cannot firmly support the release gate to prevent excessive load shift, it must have a release gate load spreader. When the total weight of containers being dropped from the C-17 and C-141 exceeds 38,000 pounds, a release gate load spreader is needed for each aft-most container. Construct and secure it as given below.

a. Nail two 3/4- by 24- by 48-inch pieces of plywood together using eightpenny nails.

b. Drill a 1/2-inch hole 2 inches from each corner.

c. Place the spreader between the sling assembly and cover or load so that the 48-inch side is parallel to the top and bottom of the container. Center the spreader on the release gate.

d. Secure the corners of the spreader to the load with type III nylon cord routed through the 1/2-inch holes.

NOTE 1: The user is responsible for offering a gate load spreader to prevent excessive load shift.

NOTE 2: The number of JAI Forms will be determined by the number of gate release plans.

2-6. Capabilities of Non-CVRS Loads

The CVRS was designed to restrain the load vertically during the aircraft flight. When the load is not restrained to CVRS standards, it must be vertically restrained for flight. These restraints will be removed up to 30 minutes before airdrop. After the restraints are removed, the aircraft will have reduced maneuverability for threat avoidance. Table 2-4 states the limitations that will occur if non-CVRS loads are used.

NOTE: When using the 48- by 53 1/2-inch skid board, drill sixteen 1/2-inch holes as shown in Figure 9-1. Then secure the skid board to the load as shown in Figure 9-6.

Table 2-4. Capability reduction of non-CVRS loads

Item	Limitations
Steel strapping	When steel strapping is used on the skid board, the load becomes non-CVRS compatible. The CVRS must be removed from the aircraft and vertical restraints must be installed.
53 1/2- by 48-inch skid board (CVRS installed)	When dropped with the CVRS, the 48-inch sides become the front and rear. The load can be dropped in either a double or single stick, but double sticks must have an even number of containers. The aircraft capabilities are C-130--1 to 14 containers; C-141--1 to 36 containers.
53 1/2- by 48-inch skid board (CVRS removed)	When the CVRS is removed, the 53 1/2-inch sides remain the front and rear. The load can be dropped in either a double or single stick, but double sticks must have an even number of containers. The load must be vertically restrained. The aircraft capabilities are C-130--1 to 16 containers; C-141--1 to 40 containers.
53 1/2- by 48-inch skid board (Inboard Logistics Rail)	When dropped with the inboard logistics rail, the 48-inch sides become the front and rear. The load can be dropped in either a double or single stick, but double sticks must have an even number of containers. The aircraft capability is C-17--1 to 26 containers.
53 1/2- by 96-inch skid board	This container is not CVRS-compatible. The system must be removed. Vertical restraints must be installed. The 53 1/2 -inch sides are the front and rear.

Note: If the loads have a front or rear overhang, the number of containers will be reduced.